Amendments to the Claims:

This listing of the claims will replace all prior versions, and listings, of claims in the application.

Listing of Claims:

Claims 1-91 (canceled)

Claim 92 (currently amended): A method of processing three-dimensional image data for a three-dimensional volumetric display having a plurality of display surfaces and addressable (x,y,z) coordinates, the method comprising:

generating three-dimensional image data comprising (x,y,z) coordinate and color information, wherein the z-coordinate information represents image depth information; ~~and~~

assigning memory locations in a multiplanar frame buffer for the three dimensional image data in accordance with the equation:

$Addr=N_{b/p}*(x+N_x*y+N_x*N_Y*z_i)$; and

providing the three-dimensional image data to the three-dimensional volumetric display based on the assigned memory locations in the multiplanar frame buffer,

wherein Addr is the assigned memory location in the multiplanar frame buffer for image data having coordinates (x,y,z), $N_{b/p}$ is the number of bytes of information stored for each pixel, N_x is the number of pixels in the x direction of the three-dimensional

volumetric display, N_Y is the number of pixels in the y dimension of the three-dimensional volumetric display, and Z_i is an integer portion of the scaled z-coordinate value.

Claim 93 (currently amended): A method of processing three-dimensional image data for a three-dimensional volumetric display having a plurality of display surfaces and addressable (r, y' and theta) coordinates, the method comprising:

generating three-dimensional image data comprising (x,y,z) coordinate and color information, wherein the z-coordinate information represents image depth information; ~~and~~

assigning memory locations in a multiplanar frame buffer for the three dimensional image data in accordance with the equation:

$Addr=N_{B/P}*(r*cosine\ (theta)+N_r*y'+N_r*N_{y'}*r*sine\ (theta))$; and

providing the three-dimensional image data to the three-dimensional volumetric display based on the assigned memory locations in the multiplanar frame buffer,

wherein Addr is the assigned memory location in the multiplanar frame buffer for image data having coordinates (r, y' and theta), $N_{B/P}$ is the number of bytes of information stored for each pixel, N_r is the number of pixels in the r direction of the three-dimensional volumetric display, and $N_{y'}$ is the number of pixels in the y' dimension of the three-dimensional volumetric display.

Claim 94 (previously presented): A three dimensiona l image display system comprising:

a multiplanar frame buffer,

a graphics data processor for generating three-dimensional image data comprising (x,y,z) coordinate and color information, wherein the z-coordinate information represents image depth information, and for assigning memory locations in said multiplanar frame buffer for said three dimensional image data in accordance with the equation:

$$Addr=N_{b/p}*(x+N_x*y+N_x*\ N_y*z_i)$$

wherein Addr is said assigned memory location in said multiplanar frame buffer for image data having coordinates (x,y,z), $N_{b/p}$ is the number of bytes of information stored for each pixel, N_x is the number of pixels in the x direction of said three-dimensional volumetric display, N_y is the number of pixels in the y dimension of said three-dimensional volumetric display, and z_i is an integer portion of the scaled z-coordinate value, and

a three-dimensional volumetric display having addressable (x,y,z) coordinates and a plurality of display surfaces on which image data stored in said multiplanar frame buffer may be displayed as a plurality of pixels.

Claim 95 (previously presented): A three dimensional image display system comprising:

a multiplanar frame buffer,

a graphics data processor for generating three-dimensional image data comprising (x,y,z) coordinate and color information, wherein the z-coordinate information represents image depth information, and for assigning memory locations in said multiplanar frame buffer for said three dimensional image data in accordance with the equation:

$$Addr=N_{B/P}*(r*cosine\ (theta)+N_r*y'\ N_r*N_{y'}*r*sine\ (theta))$$

wherein Addr is said assigned memory location in said multiplanar frame buffer for a pixel having coordinates (r, y' and theta), $N_{B/P}$ is the number of bytes of information stored for each pixel, N_r is the number of pixels in the r direction of said three-dimensional volumetric display, and $N_{y'}$ is the number of pixels in the y' dimension of said three-dimensional volumetric display, and

a three-dimensional volumetric display having addressable (r, y' and theta) coordinates and a plurality of display surfaces on which image data stored in said multiplanar frame buffer may be displayed as a plurality of pixels.

Claim 96 (currently amended): A method of processing three-dimensional image data for a three-dimensional volumetric display having a plurality of display surfaces, the method comprising:

generating three-dimensional image data comprising (x,y,z) coordinate, color information, transparency information, and brightness information, wherein the z-coordinate information represents image depth information;

storing the three dimensional image data at locations in a multiplanar frame buffer in accordance with the z-coordinate information; ~~and~~

discarding the three dimensional image data associated with a second pixel if the transparency information associated with a first pixel indicates that the first pixel is opaque, when the first pixel and the second pixel have the same (x,y) coordinate values, and the z-coordinate value associated with the second pixel indicates that the second pixel is behind the first pixel; and

providing the resulting three dimensional image data to the three-dimensional volumetric display.

Claim 97 (currently amended): A method of processing three-dimensional image data for a three-dimensional volumetric display having a plurality of display surfaces, the method comprising:

generating three-dimensional image data comprising (x,y,z) coordinate, color information, transparency information, and brightness information, wherein the z-coordinate information represents image depth information;

storing the three dimensional image data at locations in a multiplanar frame buffer in accordance with the z-coordinate information; ~~and~~

modulating the color information associated with a second pixel based on the transparency information associated with a first pixel, when the first pixel and the second pixel have the same (x,y) coordinate values, and the z-coordinate value

associated with the second pixel indicates that the second pixel is behind the first pixel; and

providing the resulting three dimensional image data to the three-dimensional volumetric display.

Claim 98 (currently amended): A method of processing three-dimensional image data for a three-dimensional volumetric display having a plurality of display surfaces, the method comprising:

generating three-dimensional image data comprising (x,y,z) coordinate, color information, transparency information, and brightness information, wherein the z-coordinate information represents image depth information;

storing the three dimensional image data at locations in a multiplanar frame buffer in accordance with the z-coordinate information; ~~and~~

modulating the brightness information associated with a second pixel based on the transparency information associated with a first pixel, when the first pixel and the second pixel have the same (x,y) coordinate values, and the z-coordinate value associated with the second pixel indicates that the second pixel is behind the first pixel; and

providing the resulting three dimensional image data to the three-dimensional volumetric display.

Claim 99 (previously presented): A three dimensional image display system comprising:

a multiplanar frame buffer,

a graphics data processor for generating three-dimensional image data comprising (x,y,z) coordinate, color information, transparency information, and brightness information, wherein the z-coordinate information represents image depth information, for storing the three dimensional image data at memory locations in the multiplanar frame buffer in accordance with the z-coordinate information, and for discarding the three dimensional image data associated with a second pixel if the transparency information associated with a first pixel indicates that the first pixel is opaque, when the first pixel and the second pixel have the same (x,y) coordinate values, and the z-coordinate value associated with the second pixel indicates that the second pixel is behind the first pixel, and

a three-dimensional volumetric display having a plurality of display surfaces on which image data stored in said mutiplanar frame buffer may be displayed as a plurality of pixels.

Claim 100 (previously presented): A three dimensional image display system comprising:

a multiplanar frame buffer,

a graphics data processor for generating three-dimensional image data comprising (x,y,z) coordinate, color information, transparency information, and brightness

information, wherein the z-coordinate information represents image depth information, for storing the three dimensional image data at memory locations in the multiplanar frame buffer in accordance with the z-coordinate information, and for modulating the color information associated with a second pixel based on the transparency information associated with a first pixel, when the first pixel and the second pixel have the same (x,y) coordinate values, and the z-coordinate value associated with the second pixel indicates that the second pixel is behind the first pixel, and

a three-dimensional volumetric display having a plurality of display surfaces on which image data stored in said multiplanar frame buffer may be displayed as a plurality of pixels.

Claim 101 (previously presented): A three dimensional image display system comprising:

a multiplanar frame buffer,

a graphics data processor for generating three-dimensional image data comprising (x,y,z) coordinate, color information, transparency information, and brightness information, wherein the z-coordinate information represents image depth information, for storing the three dimensional image data at memory locations in the multiplanar frame buffer in accordance with the z-coordinate information, and for modulating the brightness information associated with a second pixel based on the transparency information associated with a first pixel, when the first pixel and the second pixel have

the same (x,y) coordinate values, and the z-coordinate value associated with the second pixel indicates that the second pixel is behind the first pixel, and

a three-dimensional volumetric display having a plurality of display surfaces on which image data stored in said multiplanar frame buffer may be displayed as a plurality of pixels.

Claim 102 (currently amended): A method of processing three-dimensional image data for a three-dimensional volumetric display comprising:

obtaining three-dimensional image data comprising coordinate and color information for each pixel to be displayed, wherein the coordinate information includes depth coordinate information;

computing memory addresses in a multiplanar frame buffer ~~(206, 420, 610)~~ for the three-dimensional image data using the coordinate information and information as to pixel dimensions of the three-dimensional volumetric display, each of said memory addresses corresponding to a pixel to be displayed; ~~and~~

assigning the three-dimensional image data to their respective computed memory addresses in the multiplanar frame buffer, such that the three-dimensional image data for the pixels to be displayed is stored in memory locations of the multiplanar frame buffer arranged in accordance with their respective depth coordinates; and

providing the three-dimensional image data to the three-dimensional volumetric display based on the assigned computed memory locations in the multiplanar frame buffer.

Claim 103 (previously presented): The method of claim 102, wherein the three-dimensional volumetric display comprises a plurality of display surfaces arranged along the depth coordinate.

Claim 104 (previously presented): The method of claim 103 wherein said computing step comprises:

reading the depth-coordinate information;

scaling the depth-coordinate information within a range corresponding to a number of the display surfaces arranged along the depth coordinate in the three-dimensional volumetric display upon which the three-dimensional image is to be displayed; and

computing the memory address in the multiplanar frame buffer for the three-dimensional image data using the coordinate information, the information as to the pixel dimensions of the three-dimensional volumetric display, and the scaled depth-coordinate information.

Claim 105 (previously presented): The method of claim 102 wherein the three-dimensional volumetric display has addressable (x,y,z) coordinates.

Claim 106 (previously presented): The method of claim 105 wherein said computing step comprises computing the memory addresses in the multiplanar frame buffer for the three-dimensional image data in accordance with the equation:

$$Addr=N_{b/p}*(x+N_x*y+N_x*N_y*z_i)$$

wherein Addr is the memory address in the multiplanar frame buffer for image data having coordinates (x,y,z), $N_{b/p}$ is the number of bytes of information stored for each pixel, N_x is the number of pixels in the x direction of the three-dimensional volumetric display, N_y is the number of pixels in the y dimension of the three-dimensional volumetric display, and z_i is an integer portion of the scaled depth-coordinate value in the z dimension.

Claim 107 (previously presented): The method of claim 102 wherein the three-dimensional volumetric display has addressable (r, y' and θ) coordinates.

Claim 108 (previously presented): The method of claim 107 wherein the computing step comprises the step of computing memory addresses in the multiplanar frame buffer for the three-dimensional image data in accordance with the equation:

$$Addr=N_{B/P}*(r*cosine\ (\theta)+ N_r*y' +N_r*N_{y'}*r*sine\ (\theta))$$

wherein Addr is the memory address in the multiplanar frame buffer for image data having coordinates (r, y' and θ), $N_{B/P}$ is the number of bytes of information stored for each pixel, N_r is the number of pixels in the r direction of the three-dimensional

volumetric display, and $N_{y'}$ is the number of pixels in the y' dimension of the three-dimensional volumetric display.

Claim 109 (previously presented): The method of claim 102 wherein the assigning step comprises:

providing a first memory;

storing the three-dimensional image data in the first memory; and

transferring the three-dimensional image data stored in the first memory to their respective computed memory addresses in the multiplanar frame buffer.

Claim 110 (currently amended): The method of claim 102, wherein the providing step comprises ~~further comprising~~ the step of transferring the three-dimensional image data to the three-dimensional volumetric display in accordance with the depth-coordinate information.

Claim 111 (previously presented): The method of claim 102 wherein the three-dimensional image data further comprises transparency information.

Claim 112 (previously presented): The method of claim 110 further comprising displaying an image on the three-dimensional volumetric display.

Claim 113 (previously presented): The method of claim 103 wherein the plurality of display surfaces of the three-dimensional volumetric display comprises multiple planes upon which an image is displayed.

Claim 114 (previously presented): The method of claim 102 wherein the three-dimensional volumetric display comprises a plurality of self-luminescent optical elements.

Claim 115 (previously presented): The method of claim 102 wherein the three-dimensional volumetric display is a swept-volume display.

Claim 116 (previously presented): The method of claim 102 wherein the obtaining step comprises generating the three-dimensional image data with a personal computer.

Claim 117 (previously presented): The method of claim 102 wherein the obtaining step comprises converting the three-dimensional image data into data corresponding to a plurality of two-dimensional cross-sectional images to form a three-dimensional image.

Claim 118 (previously presented): The method of claim 102 wherein the obtaining step comprises generating the three-dimensional image data by an application programming interface.

Claim 119 (previously presented): The method of claim 102 wherein the obtaining step comprises generating the three-dimensional image data from a plurality of geometric primitives.

Claim 120 (previously presented): The method of claim 102, wherein the assigning step comprises the step of storing the three-dimensional image data in their respective computed memory addresses in the multiplanar frame buffer.

Claim 121 (previously presented): The method of claim 111 further comprising the step of discarding the three-dimensional image data associated with a second pixel if the transparency information associated with a first pixel indicates that the first pixel is opaque, when the first pixel and the second pixel have the same (x,y) coordinate values, and the depth-coordinate value associated with the second pixel indicates that the second pixel is behind the first pixel, wherein the first pixel and the second pixel are associated with different computed memory addresses in the multiplanar frame buffer.

Claim 122 (previously presented): The method of claim 111 further comprising the step of modulating the color information associated with a second pixel based on the

transparency information associated with a first pixel, when the first pixel and the second pixel have the same (x,y) coordinate values, and the depth-coordinate value associated with the second pixel indicates that the second pixel is behind the first pixel, wherein the first pixel and the second pixel are associated with different computed memory addresses in the multiplanar frame buffer.

Claim 123 (previously presented): The method of claim 103 wherein the assigning step comprises the step of assigning the three-dimensional image data to be displayed on the same display surface to the memory addresses within one common physical partition of the multiplanar frame buffer.

Claim 124 (previously presented): The method of claim 103 wherein the assigning step comprises the step of assigning the three-dimensional image data to be displayed on the same display surface to the memory addresses within one common logical partition of the multiplanar frame buffer.

Claim 125 (previously presented): The method of Claim 102, wherein the multiplanar frame buffer is located in the three-dimensional volumetric display.

Claim 126 (previously presented): The method of Claim 109, wherein the first memory comprises a multiplanar frame buffer.

Claim 127 (previously presented): The method of Claim 102, further comprising the step of processing the three-dimensional image data.

Claim 128 (previously presented): The method of Claim 127, wherein the processing step comprises performing depth testing.

Claim 129 (previously presented): The method of Claim 127, wherein the processing step comprises performing multiplanar antialiasing.

Claim 130 (previously presented): The method of Claim 127, wherein the processing step comprises performing alpha blending.

Claim 131 (previously presented): A three-dimensional image display system for displaying a three-dimensional image on a three-dimensional volumetric display, comprising:

a multiplanar frame buffer for storing three-dimensional image data, and

a graphics data processor for (1) receiving the three-dimensional image data comprising coordinate and color information for each pixel to be displayed, wherein the coordinate information includes depth coordinate information, (2) computing memory addresses in the multiplanar frame buffer for the three-dimensional image data using the coordinate information and information as to pixel dimensions of the three-dimensional volumetric display, each of said memory addresses corresponding to a pixel to be

displayed, and (3) assigning the three-dimensional image data to their respective computed memory addresses in the multiplanar frame buffer, such that the three-dimensional image data for the pixels to be displayed is stored in memory locations of the multiplanar frame buffer arranged in accordance with their respective depth coordinates.

Claim 132 (previously presented): The three-dimensional image display system of claim 131, wherein the three-dimensional volumetric display comprises a plurality of display surfaces arranged along the depth coordinate.

Claim 133 (previously presented): The three-dimensional image display system of claim 132 wherein the graphics data processor

reads the depth-coordinate information;

scales the depth-coordinate information within a range corresponding to a number of the display surfaces arranged along the depth coordinate in the three-dimensional volumetric display upon which the three-dimensional image is to be displayed; and

computes the memory addresses in the multiplanar frame buffer for the three-dimensional image data using the coordinate information, the information as to the pixel dimensions of the three-dimensional volumetric display, and the scaled depth-coordinate information.

Claim 134 (previously presented): The three-dimensional image display system of claim 131 wherein the three-dimensional volumetric display has addressable (x,y,z) coordinates.

Claim 135 (previously presented): The three-dimensional image display system of claim 134 wherein the graphics data processor further computes the memory addresses in the multiplanar frame buffer for the three-dimensional image data in accordance with the equation:

$$Addr=N_{b/p}*(x+N_x*y+N_x*N_y*z_i)$$

wherein Addr is the memory address in the multiplanar frame buffer for image data having coordinates (x,y,z), $N_{b/p}$ is the number of bytes of information stored for each pixel, N_x is the number of pixels in the x direction of the three-dimensional volumetric display, N_y is the number of pixels in the y dimension of the three-dimensional volumetric display, and z_i is an integer portion of the scaled depth-coordinate value in z dimension.

Claim 136 (previously presented): The three-dimensional image display system of claim 131 wherein the three-dimensional volumetric display has addressable (r, y' and θ) coordinates.

Claim 137 (previously presented): The three-dimensional image display system of claim 136 wherein the graphics data processor further computes the memory addresses in the multiplanar frame buffer for the three-dimensional image data in accordance with the equation:

$$Addr = N_{B/P} * (r * cosine\ (\theta) + N_r * y' + N_r * N_{y'} * r * sine\ (\theta))$$

wherein Addr is the memory addresses in the multiplanar frame buffer for image data having coordinates (r, y' and θ), $N_{B/P}$ is the number of bytes of information stored for each pixel, N_r is the number of pixels in the r direction of the three-dimensional volumetric display, and $N_{y'}$ is the number of pixels in the y' dimension of the three-dimensional volumetric display.

Claim 138 (previously presented): The three-dimensional image display system of claim 131 further including a first memory, wherein the graphics data processor further

stores the three-dimensional image data in the first memory; and

transfers the three-dimensional image data stored in the first memory to their respective computed memory addresses in the multiplanar frame buffer.

Claim 139 (previously presented): The three-dimensional image display system of claim 131 wherein the graphics data processor further transfers the three-dimensional

image data to the three-dimensional volumetric display in accordance with the depth-coordinate information.

Claim 140 (previously presented): The three-dimensional image display system of claim 131 wherein the three-dimensional image data further comprises transparency information.

Claim 141 (previously presented): The three-dimensional image display system of claim 139 wherein the graphics data processor further displays an image on the three-dimensional volumetric display.

Claim 142 (previously presented): The three-dimensional image display system of claim 132 wherein the plurality of display surfaces of the three-dimensional volumetric display comprises multiple planes upon which an image is displayed.

Claim 143 (previously presented): The three-dimensional image display system of claim 131 wherein the three-dimensional volumetric display comprises a plurality of self-luminescent optical elements.

Claim 144 (previously presented): The three-dimensional image display system of claim 131 wherein the three-dimensional volumetric display is a swept-volume display.

Claim 145 (previously presented): The three-dimensional image display system of claim 131 wherein the graphics data processor further generates the three-dimensional image data with a personal computer.

Claim 146 (previously presented): The three-dimensional image display system of claim 131 wherein the graphics data processor further converts the three-dimensional image data into data corresponding to a plurality of two-dimensional cross-sectional images that form the three-dimensional image.

Claim 147 (previously presented): The three-dimensional image display system of claim 131 wherein the graphics data processor further generates the three-dimensional image data by an application programming interface.

Claim 148 (previously presented): The three-dimensional image display system of claim 131 wherein the graphics data processor further generates the three-dimensional image data from a plurality of geometric primitives.

Claim 149 (previously presented): The three-dimensional image display system of claim 140, wherein the graphics data processor is further designed to discard the three-dimensional image data associated with a second pixel if the transparency information associated with a first pixel indicates that the first pixel is opaque, when the

first pixel and the second pixel have the same (x,y) coordinate values, and the depth-coordinate value associated with the second pixel indicates that the second pixel is behind the first pixel, wherein the first pixel and the second pixel are associated with different computed memory addresses in the multiplanar frame buffer.

Claim 150 (previously presented): The three-dimensional image display system of claim 140, wherein the graphics data processor modulates the color information associated with a second pixel based on the transparency information associated with a first pixel, when the first pixel and the second pixel have the same (x,y) coordinate values, and the depth-coordinate value associated with the second pixel indicates that the second pixel is behind the first pixel, wherein the first pixel and the second pixel are associated with different computed memory addresses in the multiplanar frame buffer.

Claim 151 (previously presented): The three-dimensional image display system of claim 132 wherein the graphics data processor further assigns the three-dimensional image data to be displayed on the same display surface to the memory addresses within one common physical partition of the multiplanar frame buffer.

Claim 152 (previously presented): The three-dimensional image display system of claim 132 wherein the graphics data processor further assigns the three-dimensional image data to be displayed on the same display surface to the memory addresses within one common logical partition of the multiplanar frame buffer.

Claim 153 (previously presented): The three-dimensional image display system of Claim 131, wherein the multiplanar frame buffer is located in the three-dimensional volumetric display.

Claim 154 (previously presented): The three-dimensional image display system of Claim 138, wherein the first memory comprises a multiplanar frame buffer.

Claim 155 (previously presented): The three-dimensional image display system of Claim 131, wherein the graphics data processor processes the three-dimensional image data prior to assigning the three-dimensional image data to their respective computed memory addresses in the multiplanar frame buffer

Claim 156 (previously presented): The three-dimensional image display system of Claim 155, wherein the graphics data processor processes the three-dimensional image data by performing depth testing.

Claim 157 (previously presented): The three-dimensional image display system of Claim 155, wherein the graphics data processor processes the three-dimensional image data by performing multiplanar antialiasing.

Claim 158 (previously presented): The three-dimensional image display system of Claim 155, wherein the graphics data processor processes the three-dimensional image data by performing alpha blending.

Claim 159 (previously presented): The three-dimensional image display system of claim 131, further comprising the three-dimensional volumetric display.